USDA
NATURAL RESOURCES
CONSERVATION SERVICE

MARYLAND CONSERVATION
PRACTICE STANDARD

ACCESS ROAD

CODE 560
(Reported by Ft.)

DEFINITION

A travel-way for equipment and vehicles constructed as part of a conservation plan.

PURPOSE

To provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises while protecting the soil, water, fish, wildlife, and other adjacent natural resources.

CONDITIONS WHERE PRACTICE APPLIES

Where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where travel ways are needed in a planned land use area. Where access is needed between cropland, woodland, and farm buildings and where this existing travel is causing excessive erosion and where a new road is being planned to allow access on the farm, without creating environmental problems.

Access road may include the improvement of an existing intra-farm road where both realignment and resurfacing may be needed.

Access roads range from seasonal use roads, designed for low speed and rough driving conditions, to all-weather roads heavily used by the public and designed with safety as a high priority. Some roads are only constructed for a single purpose; i.e. control of forest fires, logging and forest management activities, access to remote recreation areas, or access for maintenance of facilities.

This standard does not apply to access roads used for the purpose of providing access from public roads and highways to farm headquarters.

CONSIDERATIONS

Consider visual resources and environmental values during the planning and designing of the road system. Access roads should be located where minimal adverse impacts will affect wetlands, water bodies and wildlife habitat. Consideration should be given to the following:

1. Effects on downstream flows or aquifers that would affect other water uses or users;
2. Effects on the volume and timing of downstream flow to prohibit undesirable environmental, social, or economic effects;
3. Short-term and construction-related effects of this practice on the quality of on-site downstream water courses;
4. Overall effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances that would be carried by runoff from construction activities;
5. Effects on wetlands and water-related wildlife habitats that would be associated with the practice.

CRITERIA

General

Design access roads to serve the enterprise or planned use with the expected vehicular or equipment traffic. Consider the type of vehicle or equipment, speed, loads, soil, climatic, and other conditions under which vehicles and equipment are expected to operate. Planned work shall

comply with all federal, state and local laws and regulations.

Where general public use is anticipated, design roads to meet applicable federal, state and local criteria.

Access roads planned for woodland harvest operations shall conform to any additional requirements necessary for that type of operation.

Location

Locate roads to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, to make the best use of topographic features, and to include scenic vistas where possible. Follow natural contours and slopes where practical to minimize disturbance of drainage patterns. Locate roads where they can be maintained and where water management problems are not created. To reduce potential pollution, locate roads away from watercourses and utilize buffers where possible to protect water bodies.

Alignment

The gradient and horizontal alignment shall be adapted to the intensity of use, mode of travel, the type of equipment and load weights, and the level of development.

Grades normally should not exceed 10 percent except for lengths less than 100 feet. Maximum grades of 18 percent should only be exceeded if necessary for special uses such as logging roads, field access roads, fire protection roads or other roads not accessible for use by the general public. For grades over 15 percent, special consideration shall be given to surface treatment and water control.

For stream crossings, align the road so that it crosses perpendicular to the channel, when practical.

Width

The minimum width of the roadbed is 14 ft for one-way traffic and 20 ft for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic. Each type of road also requires 2 feet of shoulder width on each side. Single-lane logging or special-purpose roads can have a minimum width of 10 feet, with greater widths at curves and turnouts. Increase the two-way traffic width approximately 4 feet for trailer traffic. The shoulder width may be either gravel or grass.

Use turnouts on single lane roads where vehicles travel in both directions on a limited basis. Where turnouts are used, increase road width to a minimum of 20 feet for a minimum distance of 30 feet.

Side Slopes

Design all cuts and fills to have stable slopes of a minimum of 2 horizontal to 1 vertical on heights of less than 4 feet. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted, if soil conditions warrant and special stabilization measures are installed.

Avoid areas with geological conditions, or with soils subject to slides, or provide treatment to prevent slides.

Drainage

The type of drainage structure used will depend on the intended use and runoff conditions. Provide culverts, bridges, fords, or grade dips for water management at all natural drainage ways. Where access roads cross existing streams, the conservation practice standard for stream crossing shall apply. Table 1 lists minimum design storm frequencies for various road types to convey the storm runoff without causing erosion or road overtopping.

Table 1

Road Type	Storm Frequency
Forest Access Roads, Farm Field Access Roads	2 year - 24 hour
Farm Driveways, Recreation Facility Access Roads	10 year - 24 hour
Public Access Roads, Camp-grounds, Etc.	25 year - 24 hour

An erosion-resistant low point or overflow area may be constructed across the access road to supplement culvert capacity on non-public use roads. Install culverts, bridges, fords and hardened overflow areas so the road crossing does not impact fish migration.

Roadside ditches shall be adequate to provide surface drainage for the roadway and deep enough, as needed to serve as outlets for subsurface drainage. Use a minimum depth for roadside ditches of 1.0 foot below the top of road surface to provide internal drainage. Design ditch channels on stable grades or protected with structures or linings for stability.

Water-breaks or water-bars may be used to control surface runoff on low-intensity use forest, ranch or similar roads. On steep grades where runoff and erosion is anticipated down the road, water bars should be considered. Construct water bars of materials that are compatible with the use and maintenance of the road surface. Water bar discharge areas must be well vegetated or have other erosion resistant materials. See chart for Recommended Spacing of Relief Culverts and Water Bars Based on Soil Type.

Surface crowning can also help direct road runoff into the side drainage ditches. Unobstructed flow into the ditches must be maintained to prevent flows from causing roadside erosion. Provide a turnaround at the end of dead end roads. In some areas, turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

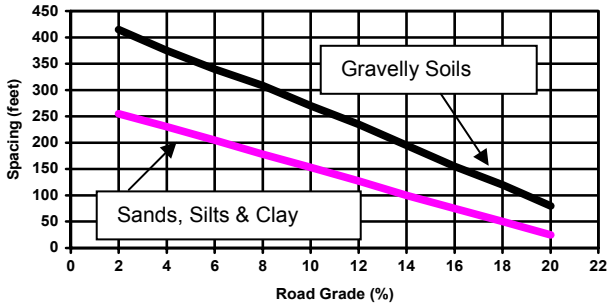
Provide parking space as needed to keep vehicles off the road or from being parked in undesirable locations.

Surfacing

Access roads shall be given a wearing course or surface treatment if required by traffic needs, soil, climate, erosion control, or dust control. The type of treatment, if needed, depends on local conditions, available materials, and the existing road base. If these factors or the volume of traffic is not a problem, no special treatment of the surface is required. On weak bearing capacity soils such as silts, organics, and clays, the surface treatment should be underlain with a geotextile material specifically designed for road stabilization applications when the road is used on a regular basis.

Unsurfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions.

Figure 1
Recommended Spacing of Relief Culverts and Water Bars Based on Soil Types



Toxic and acid-forming materials shall not be used on roads. This should not be construed to prohibit use of chemicals for dust control and snow and ice removal after considering potential impacts on stabilizing vegetation.

Construction Operations

Construction operations should be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits. Construction shall include the following requirements as necessary for the job:

1. Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area;
2. Unsuitable material shall be removed from the roadbed area;
3. Grading, sub-grade preparation, and compaction shall be done as needed;
4. Surfacing shall be done as needed.

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures to be employed during the construction process.

Traffic Safety

Provide passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow. Traffic safety shall be a prime factor in selecting the angle and grade of the intersection with public highways. Preferably, the angles shall be not less than 85 degrees. The public highway shall be entered either at the top of a hill or far enough from the top or a curve to provide visibility and a safe sight distance. Use a minimum clear sight distance to each side of 300 feet or as required by local regulations.

SPECIFICATIONS

The work shall consist of construction of the access road at the location, and to the sections and grades shown on the drawings, and as staked in the field.

Protect watercourses and water quality during and after construction by erosion-control facilities and maintenance. Filter strips, water and sediment control basins, and other conservation practices shall be used and maintained as needed.

Foundation Preparation

All trees, brush, stumps, and other obstructions will be removed from the construction area and disposed of in a specified disposal area in a manner that will not cause pollution to ground or surface water.

Earth Fill

Borrow – All fill material shall be the type indicated on the drawings, and shall be obtained from borrow areas noted on the plans. Fill shall contain no frozen material, sod, limbs, roots, rubbish, or other objectionable material. Stones larger than 4 inches shall not be used as fill.

Placement and Compaction – Place and spread fill material in lifts of 6 inches or less in thickness and compact by routing the hauling and spreading equipment in such a manner that the entire surface of each lift is traversed by at least one tread track of the equipment. The fill material shall be moist, not dry or saturated.

Structures

Install all structures, including culverts, box inlets or subsurface drains, should be durable material to the grades and elevations shown on the drawings.

Vegetation

Stabilize all disturbed areas in accordance with conservation practice standard Critical Area Planting (342). Any special protection materials shall be installed per manufacturer's instructions.

OPERATION AND MAINTENANCE

An operation and maintenance plan will be developed and carried out for the life of the practice. The plan should include but is not limited to the following measures:

1. Inspect culverts, roadside ditches, water bars and outlets after each major runoff event and restore flow capacity as needed;

2. Maintain grass areas in adequate cover. Reseed and mow as needed;

3. Fill low areas in travel treads and regrade, as needed, to maintain road cross section;

4. Inspect roads with water bars periodically to insure proper cross section is available and outlets are stable.

SUPPORTING DATA AND DOCUMENTATION

Field Data and Survey Notes

Record on SCS-ENG-28-29, and/or other appropriate paper:

1. Profile of proposed access road;
2. Cross-sections at each design reach, culvert and cross drain locations and all other critical areas;
3. Appropriate surveys of all proposed conservation practices;
4. Watersheds above proposed culverts, cross drains, and other conservation practices. Record Watershed size, slope, cover and soil type (Hydrologic soil group);
5. Location and type of outlets for proposed culverts, cross drains, and other conservation practices.

Design Data

Record on appropriate NRCS forms:

1. Complete landowner data and location sketch;
2. Drawing of access road layout;
3. Plot of profile of access road;
4. Cross-section dimensions for each design reach, culvert and cross drain locations, and all other critical areas;
5. Individual designs for culverts, cross drains, and other conservation practices;
6. Record construction notes, construction specifications, construction sequence, Miss Utility statement and materials list;
7. Record complete permanent seeding and maintenance requirements.

Construction Check Data

Record on SCS-ENG-28-29, and plot in "red" on drawings:

1. Profile of access road;
2. Cross sections per design reach for road and at all culverts and cross drain locations and all other critical areas;
3. Appropriate surveys of all other conservation practices installed;
4. Constructed length of access road;
5. Length, size, and type of culvert pipes installed;
6. Type of wearing surface installed;
7. Type of vegetation planted and quality of stand;
8. Quantities of all other conservation practices installed;
1. Sign and date notes including statement that the practice meets or exceeds plans and specifications.

REFERENCES

2. American and Steel Institute, 1983. *Handbook of Steel Drainage and Highway Construction Products, Third Edition.*
3. Maryland Department of the Environment, *Soil Erosion and Sediment Control Guidelines for Forest Harvest Operations in Maryland*. Baltimore, Maryland.
4. Maryland Department of Transportation, State Highway Administration, January, 2001. *Standard Specifications for Construction and Materials.* Baltimore, Maryland.
5. USDA, Natural Resources Conservation Service, *Engineering Field Manual*.
6. USDA, Natural Resources Conservation Service, *National Handbook of Conservation Practices*.
7. USDA, Natural Resources Conservation Service, 1986. *Technical Release No. 55, Urban Hydrology for Small Watersheds*.
8. USDA, Natural Resources Conservation Service, 1990. *Technical Release No. 77, Design and Installation of Flexible Conduits*.